IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

re Patent Application of	**MAIL STOP AF**
Patrick Matthews et al.	Group Art Unit: 1764
Application No.: 10/740,265	Examiner: ELLEN M. MCAVOY
Filed: December 17, 2003	Confirmation No.: 1917
For: METHOD AND SYSTEM FOR PREVENTING CLATHRATE HYDRATE BLOCKAGE FORMATION IN FLOW LINES BY ENHANCING WATER CUT	

PRE-APPEAL BRIEF REQUEST FOR REVIEW

Commissioner for Patents
P.O. Box 1450
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Sir:

Applicants request review of the final rejection of Claims 1-26 set forth in the final Official Action dated August 8, 2007. A Notice of Appeal is submitted herewith. No amendments are being filed with this Request.

Rejections Set Forth in Final Official Action

Claims 1-26 stand finally rejected under 35 U.S.C. § 103(a) as allegedly obvious over Colle '269, Colle '083, and Peiffer. Applicants respectfully disagree with the rejection; therefore, this rejection is respectfully traversed.

Inclusion of Hydrate Inhibitors in the Water of the Present Claims *Would* Affect the Basic and Novel Characteristics of the Presently Claimed Invention

The present invention adds water to a hydrocarbon containing fluid to enhance the watercut of the hydrocarbon containing fluid. Sufficient water may be added such that, even though hydrates may form from hydrocarbon hydrate forming components in the hydrocarbon containing fluid, such hydrates cooperate with the added water to form a flowable slurry rather than allowing the hydrates to form a plug in the flow line. Accordingly, the claims recite that the water cut enhanced hydrocarbon containing fluid consists essentially of hydrocarbon containing fluid, water, and optionally salt or brine.

As the Examiner points out, the transitional phrase "consisting essentially of" limits the scope of a claim to the specified materials or steps "and those that do not materially affect the basic and novel characteristic(s)" of the claimed invention. *In re Herz*, 537 F.2d 549, 551-52, 190 USPQ 461, 463 (CCPA 1976) (emphasis in original).

Applicants respectfully submit that the basic and novel characteristic of the claimed invention is the use of water added to the hydrocarbon containing fluid as the primary mechanism to prevent hydrate formation blockage in a flow line rather than using hydrate inhibitors (*i.e.*, to the exclusion of hydrate inhibitors). By not using hydrate inhibitors, the present invention provides a simple, cost-effective, and environmentally friendly strategy to address multiple flow assurance issues. See, for example, page 8, lines 15-28 of the present specification, which explain,

> [B]rine also enhances the thermodynamic effect on hydrate stability produced by adding water to the system. Water also improves heat retention thereby improving thermal performance of the system which might be helpful for mitigating certain flow assurance issues. Switching to water or high salinity brine injection as the hydrate inhibition strategy is also expected to reduce chemical inhibitor presence in water and the oil phase. This will have significant benefits for topside water clean up and should result in reduced penalties imposed on an operator by downstream refineries due to the elimination of methanol from crude oil. Therefore, the proposed strategy is also a more environmentally friendly hydrate inhibition strategy as compared to the current thermodynamic and/or LDHI inhibitor injection strategy since storage, handling, and processing of flammable (methanol), potentially toxic (anti-agglomerant LDHIs) chemicals can be eliminated from offshore operations.

As noted in MPEP § 2141.02, subsection VI., a prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984).

Applicants respectfully submit that each of the cited references teaches the use of ***hydrate inhibitors*** to prevent hydrate formation and thus blockage in a flow line. (See Column 2, Lines 23-27, of Colle '269; Column 2, Lines 24-29, of Colle '083; and Column 2, Lines 29-34, of Peiffer). Specifically, each of the cited references is directed to solving the

> need for a ***gas hydrate inhibitor*** that can be conveniently mixed at ***low concentrations*** in produced or transported petroleum fluids[, and

> which] reduce[s] the rate of nucleation, growth, and/or agglomeration of gas hydrate crystals in a petroleum fluid stream and thereby inhibit the formation of a hydrate blockage in the pipe conveying the petroleum fluid stream.

(Emphasis Added; Column 2, Lines 6-12, of Colle '269; Column 2, Lines 1-7, of Colle '083; and Column 2, Lines 6-12, of Peiffer).

The Examiner's "position [is] that the addition of the smallest amount in Colle '269, [Colle '083, or Peiffer,] about 0.01 % by weight, of the gas hydrate inhibitors to the water component which optionally may contain salt or brine, does not affect the basic and novel characteristics of the claimed invention." (Final Office Action, Pages 3-5).

However, Applicants respectfully submit that the inclusion of hydrate inhibitors, for example, hydrate inhibitors that can be mixed at ***low concentrations*** of about 0.01%, according to Colle '269, Colle '083, and Peiffer, ***does*** materially affect the basic and novel characteristic of the claimed invention and moreover frustrates the purpose of the claimed invention, as the claimed invention avoids not only the need to incur the cost of providing hydrate inhibitors, but also the complications of handling and disposal of hydrate inhibitors. See, for example, page 2, lines 8-22, of the present specification, which explain, with regard to dehydration, heat and/or pressure management or chemical injection with thermodynamic or low dosage hydrate inhibitors (LDHI) -- technologies currently used to prevent hydrate blockage formation --

> Each of these solutions for hydrate prevention can work, but all require significant capital or operating expense. The thermal and dehydration options are capital intensive, the thermodynamic inhibitor options are both capital and operationally intensive, and the LDHI option is operationally intensive. LDHIs also have additional risk associated with their application due to the relative immaturity of the technology. Additionally, discharge water quality (toxicity) and crude quality (methanol content for example) issues can be a concern when using both thermodynamic inhibitors and LDHIs. There is also a general concern in the industry that as remote deepwater fields mature, water cuts may become high to the point where chemical injection for hydrate inhibition may offer considerable challenges--either due to the sheer volumes of thermodynamic inhibitor required or due to limitations on LDHI performance as mentioned above. Therefore, the issue of a cost-effective and reliable hydrate inhibition strategy for fields with high water cuts is a major challenge facing the industry.

The Examiner responds, "This is not deemed to be persuasive because the claimed inventive method of inhibiting hydrate formation blockage in a flow line transporting a hydrocarbon containing fluid is not affected by the addition of the hydrate inhibitors of the prior art." (Final Office Action, Page 6).

Applicants respectfully submit that the presently claimed methods ***would*** be affected by the addition of the hydrate inhibitors, especially in terms of mechanism of inhibiting hydrate formation blockage. Contrary to the position of the Examiner, which seems to be predicated upon a misconstruction of the prior art, the addition of hydrate inhibitors expressly conflicts with the teachings and purpose of the present invention. Inclusion of hydrate inhibitors in the presently claimed methods would provide the same function as the "addition of water" in the presently claimed methods, thus rendering the "addition of water" in the presently claimed invention superfluous.

Colle '269

Colle '269 does not disclose adding water to a hydrocarbon containing fluid to enhance the watercut of the hydrocarbon containing fluid, or more specifically, adding sufficient water such that, even though hydrates may form from hydrocarbon hydrate forming components in the hydrocarbon containing fluid, such hydrates cooperate with the added water to form a flowable slurry rather than allowing the hydrates to form a plug in the flow line.

Rather, Colle '269 discloses a (ball stop) time of 6.2 minutes for a 0.95 centimeter stainless steel ball to stop moving the full length of a capped 15 mm ODx12.5 cm long test tube containing 3 mL of tetrahydrofuran (THF) and 9 mL of ASTM synthetic seawater (SSW) in a THF test. (Column 7, Lines 38-53). According to Colle '269, a threshold inhibition effect for an inhibitor requires a ball stop time (BST) for a THF/SSW solution with an inhibitor which is about three times the BST for a THF/SSW control solution with no inhibitor present. (Column 7, Lines 54-65).

Claims 2-4

Claim 2 recites the method of claim 1 wherein sufficient water is added such that the water cut of the water cut enhanced hydrocarbon containing fluid is at least 50%; claim 3 recites the method of claim 1 wherein sufficient water is added such that the water cut of the water cut enhanced hydrocarbon containing fluid is at least 75%; and claim 4 recites the method of claim 1 wherein sufficient water is added

such that the water cut of the water cut enhanced hydrocarbon containing fluid is at least 85%.

With regard to claims 2-4, the Examiner acknowledges that "the specific amounts of water in some of the dependent claims is not set forth in the prior art". (Final Office Action, Pages 2, 4, and 5). The Examiner asserts, however, that each of the cited references "teaches that any convenient concentration of inhibitor in the carrier solvent can be used." (Office Action, Pages 2-3, 4, and 5).

"The examiner is of the position that this claimed limitation does not differ from the prior art references which also added water (containing hydrate inhibitor) to the hydrocarbon fluid." (Final Office Action, Page 6).

However, the Examiner has not explained in what way any of the cited references discloses or suggests a water cut of the water cut enhanced hydrocarbon containing fluid of at least 50%, 75%, or 85% (*i.e.*, an oil in water emulsion containing at 50%, 75%, or 85% water cut).

Accordingly, withdrawal of the rejection of Claims 1-26 under 35 U.S.C. § 103(a) as allegedly obvious over Colle '269, Colle '083, and Peiffer is respectfully requested.

Conclusion

Therefore, allowance of the application is respectfully requested.

Respectfully submitted,

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